TETRA TECH EM INC.

December 12, 2002

Mr. Brad Benning
On-Scene Coordinator
Emergency Response Branch
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Subject: **Removal Action Summary**
Johns Manville Site
Waukegan, Lake County, Illinois
Technical Direction Document No. S05-0203-007
Tetra Tech Contract No. 68-W-00-129

Dear Mr. Benning:

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the enclosed removal action summary report for the Johns Manville Site in Waukegan, Illinois.

If you have any questions or comments about the report or need additional copies, please contact me at (312) 946-6457 or Thomas Kouris at (312) 946-6431.

Sincerely,

Lee Christenson
Project Manager

Enclosure

cc: Lorraine Kosik, START Program Officer
Thomas Kouris, START Program Manager

REMOVAL ACTION SUMMARY
JOHNS MANVILLE SITE
WAUKEGAN, LAKE COUNTY, ILLINOIS

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 5 Emergency Response Branch
77 West Jackson Boulevard
Chicago, IL 60604

TDD No.:	S05-0203-007
Date Prepared:	December 12, 2002
Contract No.:	68-W-00-129
Prepared by:	Tetra Tech EM Inc.
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FIGURES

1.0 INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has prepared this removal action summary report for the Johns Manville Site in Waukegan, Lake County, Illinois, in accordance with Technical Direction Document (TDD) No. S05-0203-007, which the U.S. Environmental Protection Agency (U.S. EPA) assigned to START. The scope of this TDD was to perform removal oversight activities, which included monitoring site health and safety, documenting site contractor activities, reviewing and retaining site disposal documentation such as waste manifests, and monitoring START costs.

This removal action summary report discusses the site background, removal activities, and sampling activities, and provides a summary of the removal action. The appendix to this report presents a photographic log of removal activities.

2.0 SITE BACKGROUND

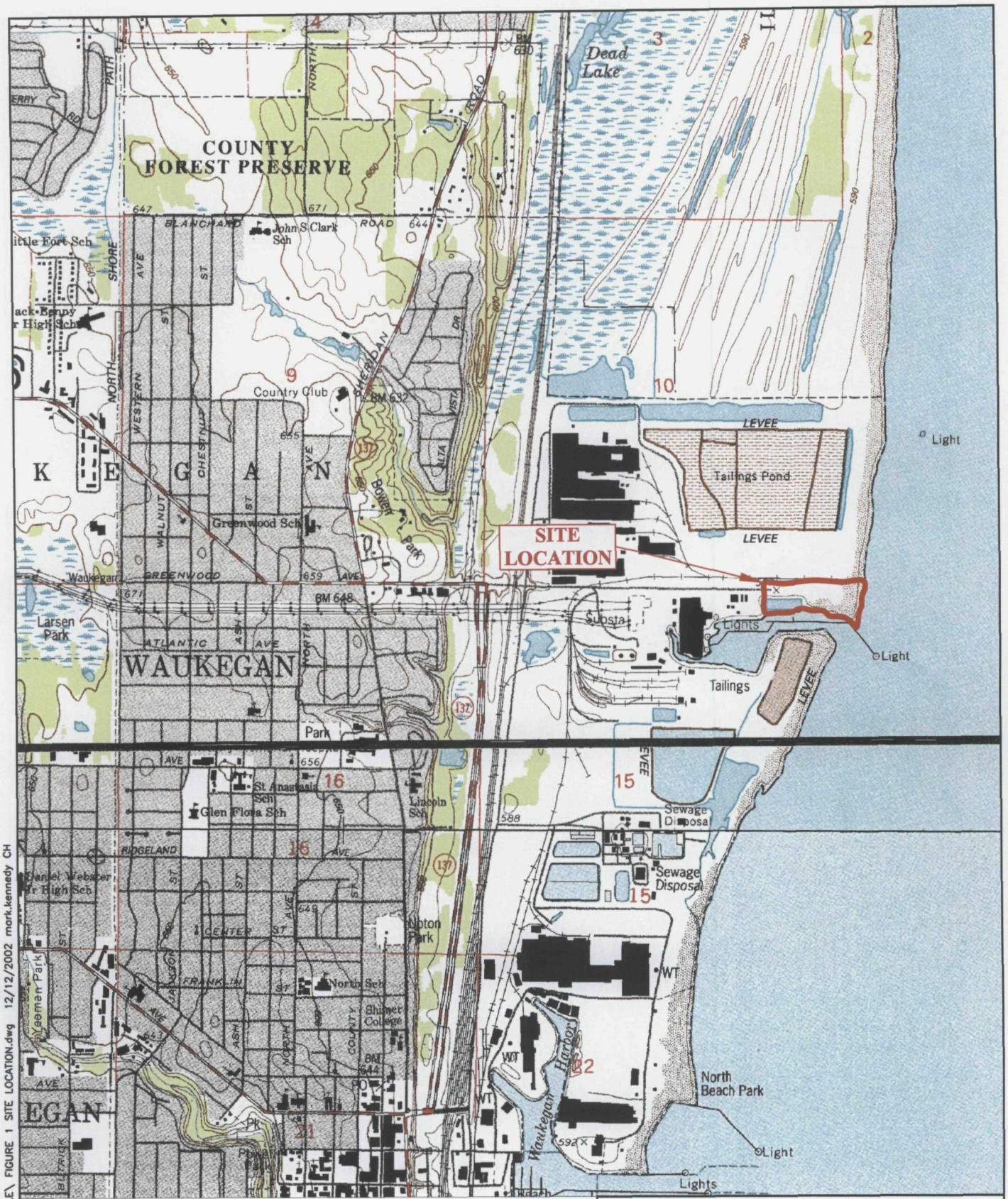
The Johns Manville Site 2 property is approximately 300 feet wide and 1,500 feet long. The site is located on the south side of Greenwood Avenue east of Pershing Road in Waukegan, Illinois (see Figure 1). The site lies between the Midwest Generation property and the Johns Manville Superfund site and is adjacent to Lake Michigan. The site geographical coordinates are latitude 42°23'05" north and longitude 87°49'26" west.

The site is located primarily on property owned by the City of Waukegan and Johns Manville Corporation and is currently under the management of the Illinois Department of Natural Resources (IDNR). In 1959, as part of a shooting range for the Pan American Games, a series of berms were constructed at the site to prevent bullets from traveling to neighboring properties. In the late 1960s, the berms were bulldozed to near grade.

Wastes present at the site originated from operations at the Johns Manville Superfund site north of Site 2. When the shooting range was constructed for the 1959 games, the Johns Manville corporation supplied asbestos-containing materials (ACM) for berm construction that contained asbestos. After activities at the Johns Manville facility ceased in 1998, a consultant to Johns Manville Corporation, ELM Consulting (ELM), conducted a site assessment of Site 2. Sample analytical results indicated that 17 grids, each measuring approximately 100 by 100 feet, contained ACM at depths of up to 3 feet below ground surface (bgs). Samples were also collected and analyzed for lead because of the past shooting range activities, but no lead-bearing materials were identified at site.

In June 1999, IDNR identified friable ACM at the site. A sample of this ACM was collected and analyzed. Analytical results indicated that the sample contained 40 to 45 percent asbestos.

Based on sample analytical results, U.S. EPA initiated a removal action at the site and directed START to support the removal action.



SOURCE: MODIFIED FROM USGS, WAUKEGAN, ILLINOIS, QUADRANGLE, 1993; AND USGS, ZION, ILLINOIS - WISCONSIN, QUADRANGLE, 1993

JOHNS MANVILLE SITE 2
WAUKEGAN, LAKE COUNTY, ILLINOIS
TDD NO. S05-0203-007

FIGURE 1

SITE LOCATION

Tetra Tech EM Inc.

G:\G\9009\L0203007-JOHNS-MANVILLE\ FIGURE 1 SITE LOCATION.dwg 12/12/2002 mark.kennedy CH

This section discusses activities conducted during the 2002 time-critical removal action at Johns Manville Site 2. Site preparation is discussed below, followed by a detailed discussion of excavation activities and site restoration activities.

3.1 SITE PREPARATIONS

On May 17, 2002, U.S. EPA and START arrived at the Johns Manville site for the purpose of staking out the excavation grids using a global positioning system (GPS). Based on a site assessment conducted by ELM, a total of 17 grids were staked out and marked for excavation to either 1, 2, or 3 feet below ground surface (bgs). Excavation areas were marked with wooden stakes and fluorescent tape.

On May 20, 2002, START and U.S. EPA's Emergency and Rapid Response Services (ERRS) contractor mobilized to the site and established trailers. Equipment such as water trucks, dump trucks, storage trailers, excavators, and loaders were also mobilized to the site. The ERRS crew began clearing vegetation from areas to be excavated first. START collected perimeter air monitoring samples in order to establish background levels before excavation activities began.

3.2 EXCAVATION ACTIVITIES

On May 21, 2002, ERRS began excavation activities. Excavation began in the center of the site in grid B5 (see Figure 2). ERRS began a waste soil stockpile at the west end of the site in grids B2 and B3. The planned excavation depth in grid B5 was 3 feet bgs. During excavation it was observed that ACM seemed to extend below 3 feet bgs; however, START and U.S. EPA decided that removing ACM from the top 3 feet of soil and backfilling with clean fill was sufficient to eliminate the threat of exposure. On May 28, 2002, the loading of trucks with waste soil for off-site disposal began. ERRS double-lined the trucks with plastic sheeting and sealed them before the trucks left the site. Excavation of grid B5 was completed on May 29, 2002. Upon completion of the grid excavation, orange snow fencing was placed at the bottom of the excavation to indicate the lower extent of excavation during any future site activities. ERRS also began to stockpile clean sand on site to be used for backfilling.

JOHNS-MANVILLE
SUPERFUND SITE

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

A

B

C

COMMONWEALTH
EDISION

LAKE
MICHIGAN

G:\G\9009\L0203007-JOHNS-MANVILLE\ FIGURE 2 EXCAVATION AREA MAP.dwg 12/12/2002 mark.kennedy CH

LEGEND

- SITE BOUNDARY
- FENCE
- SHRUBS
- AREA NOT EXCAVATED
- AREA EXCAVATED
- VISIBLE ACM OR ASBESTOS PRESENT AT MORE THAN 1 PERCENT
- NO VISIBLE ACM OR SAMPLE NONDETECT
- COMPOSITE SAMPLE COLLECTED FOR FULL SCAN
- FULL SCAN OF CLAY BACKFILL
- SAND BACKFILL ANALYZED FOR ASBESTOS

0 60 120
SCALE IN FEET

N

JOHNS MANVILLE SITE 2
WAUKEGAN, LAKE COUNTY, ILLINOIS
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FIGURE 2
EXCAVATION AREA MAP

Tetra Tech EM Inc.

By June 20, 2002, ERRS had completed excavating grids in the central portion of the site. Grids B5, B6, C6, B7, and, C9 were all determined to be contaminated in the initial site assessment and therefore were excavated. Grids B5, B7, and C9 were excavated to 3 feet bgs. Grids B6 and C6 were initially characterized as containing contamination to 2 feet bgs. After the top 2 feet of soil was removed, START collected confirmation samples from each grid. The grids were divided in four quarters, and one five-point composite sample was collected from each quarter. Analytical results from the two grid samples indicated that one half of grid B6 and three quarters of grid C6 still contained asbestos at a concentration greater than 1 percent. ERRS therefore excavated an additional 1 foot of soil from the areas exceeding the criteria.

During excavation of central portion of the site, ACM debris was often observed in grids marked as "clean" in ELM's site characterization report. For example, the north wall of the grid B6 excavation contained visible ACM and was chased into grid A6, and the east and south walls of the B7 excavation contained visible ACM and was chased into grids C7 and B8.

On June 20, 2002, excavation activities were moved to the east end of the site near the beach. ERRS began to excavate 1 foot of material from grid A14. During excavation it was noticed that the southwest portion of A14 contained ACM deeper than the 0 to 1-foot interval and it was chased to 3 feet bgs. Upon completion of excavation at A14, significant amounts of ACM were visible in the east wall of the A14 excavation. ERRS then chased ACM material east from A14 into A15. The next grid ERRS planned on excavating was B14, which was initially characterized by ELM as containing ACM at 1 to 2 feet bgs. Inspection of the south wall of the A14 excavation did not indicate any visual signs of ACM in grid B14.

On June 27, 2002, EPA, START, and ERRS discussed the major discrepancies between the initial site characterization report and the actual locations of ACM observed at the site. It was decided that before further excavation, START would conduct soil sampling in order to more accurately characterize site soil in the remaining grids. Grids were divided into four quarters, and one test trench was excavated in each quarter to an approximate depth of 3 feet bgs. Two trenches were excavated in grids that extended beyond the northern perimeter of the site. If visible ACM was present in the test trench, then no sample was collected and the trench was marked for excavation. If no visible ACM was present, then a 10-point composite sample from the trench walls was collected and sent to the laboratory for asbestos analysis. All grids yielding samples with an asbestos concentration greater than 1 percent were marked for

excavation. Figure 2 shows sampling locations and final excavation areas based on test trench excavations.

By July 17, 2002, ERRS had completed excavation of grids on the east side of the site. As discussed above, grids were excavated based on the presence of visual ACM and analytical results from samples collected from test trenches. The surface areas of grids that were not excavated were scraped in case contamination from other grids had migrated because of vehicle traffic or weather conditions. Portions of grids A10, B10, C10 A11, B11, A12, B12, C12, and C13 were excavated to approximately 3 feet bgs. Grids A13, B13, A14, B14, and A15 were entirely excavated. Excavation activities then moved back to the central portion of the site to grids that were re-characterized.

Excavation of grids in the central portion of the site began with grid B8. By July 25, 2002, ERRS had completed excavation of portions of grids B4, B8, C4, C5, and C7, where either visual ACM was present or analytical results indicated the presence of asbestos at greater than 1 percent. ERRS continued to scrape surface areas of grids not excavated. ERRS then began excavating along the north perimeter of the site that includes an access road leading to the east end the site. Excavation of the site access road began with grid A8, moving west through A5. All soil characterization samples collected from the four grids, except A7 west, indicated asbestos concentrations greater 1 percent. Excavation of grid A5 was completed on August 1, 2002. Excavation activities then moved to grid B1.

Excavation of grid B1 was completed on August 5, 2002. The remaining grids marked for excavation included A1 through A4, B2, B3, C2, and C3. The remaining grids encompassed what remained of the site access road and the current load-out area. ERRS moved the tarping station north along row A so that excavation activities could begin in grids C2 and C3. ERRS completed excavating C2 and C3 and began excavating the remaining portion of the site access road in grids A1 through A4. In order to allow trucks site access, excavation of grids A1 through A4 was conducted in rows, starting in A1 and moving east through A4 and back until the grids were complete. ERRS completed excavation of A1 through A4 on August 16, 2002.

On August 19, 2002, ERRS began excavating B2 and B3 where the soil stockpile had been located. ERRS loaded out the remaining stockpile and began stockpiling and loading soil into trucks as the grids were excavated. On August 29, 2002, excavation and load-out activities were completed at Johns Manville Site. A total of 46,869.92 tons of ACM and soil was shipped off site to the Mallard Ridge

landfill in Delevan, Wisconsin. ERRS scraped the surface of the concrete pad, used as a decon pad, located in row 4 of the site. Soil scraped from the pad was loaded out with the last truckload of ACM-contaminated soil.

3.3 SITE RESTORATION ACTIVITIES

On May 30, 2002, ERRS began backfilling grids that had been excavated. Backfilling began in grid B5. The first grids, B5 and B7, were backfilled with 3 feet of sand to grade. It was then decided that because contamination could extend beyond the maximum excavation depth of 3 feet bgs, the remaining grids would be backfilled with clay up to 1 foot bgs and the remainder of the grid would be filled with 1 foot of sand to grade. Grids on the far east end of the site were only backfilled with sand because this was the native makeup along the beach area. Backfilling and grading activities were completed on September 12, 2002.

ERRS then restored the site access road and parking lot. These areas were reconstructed by first placing geotextile in the access road and parking lot areas and then covering the geotextile with stone. Upon completion of the access road and parking lot, the site was hydro-seeded with vegetation that would grow in the sand cover on the site. On September 19, 2002, activities at Johns Manville Site were complete.

This section describes sampling activities conducted at Johns Manville Site, including perimeter and personnel air sampling, soil sampling, and backfill sampling.

4.1 PERIMETER AND PERSONNEL AIR SAMPLING

During site activities, START collected perimeter and personnel air samples in order to monitor both the potential transport of airborne asbestos off site as well as the exposure of site workers to airborne asbestos. A dust monitor was also placed in the cab of the excavator during excavation activities. On May 20, 2002, START collected perimeter air samples prior to the start of excavation activities in order to determine background levels at the site.

Both perimeter and personnel air monitoring samples were analyzed using phase contrast microscopy (PCM) analysis with a turnaround time of 24 hours. Samples were collected at minimum flow rate of 2.0 liters per minute (L/min) and ran for a minimum of 500 minutes for a sample volume of at least 1,000 liters. A minimum of four perimeter air samples and one personnel air sample were collected every day. Once excavation activities moved away from the load-out area and additional site workers were on site, additional perimeter and personnel air monitoring samples were collected. A maximum of five perimeter air monitoring samples and three personnel air monitoring samples were collected. Perimeter air samples were collected at each of the four site boundaries, and personnel monitoring rotated daily among the site workers.

Both perimeter and personnel air monitoring sample analytical results were compared to the Occupational Health and Safety Administration (OSHA) permissible exposure level (PEL) for asbestos fibers of less then 0.1 fiber per cubic centimeter (cc) of air *(Title 29 Of the Code of Federal Regulations 1910.1001)*. Throughout the duration of site activities, all air sample analytical results were significantly below the OSHA PEL, with a maximum result of 0.0105 fiber per cc. On July 1, 2002, personnel air monitoring was suspended in accordance with the asbestos standard in 29 CFR 1926.1101(f) because personnel monitoring at the site had shown that exposure was below the PEL and that a "negative exposure assessment" had been demonstrated. Perimeter air monitoring samples were collected from May 20 through August 29, 2002, when excavation and load-out activities were completed.

4.2 SOIL SAMPLING

The initial site work plan called for 17 grids to be excavated at varying depths of 1 to 3 feet bgs based on ELM's initial site characterization report. Confirmation sampling was to be conducted at the base of all grids that were to be excavated to a maximum depth of 2 feet bgs. Once it was discovered during excavation activities that ACM was present in areas marked as "clean" in the initial site characterization report, U.S. EPA, START, and ERRS decided to conduct more comprehensive soil characterization sampling activities.

In order to more accurately define the extent of ACM at the site, a series of test trenches were excavated in the remaining grids. A maximum of four trenches were excavated in each grid depending on the size of the grid. If visible ACM was present in the trench after excavation, that portion of the grid was automatically marked for excavation. If no visible ACM was present, then a soil sample was collected from the test trench. Each soil sample consisted of a 10-point composite sample collected in an aluminum pie tin, homogenized, placed in a 4-ounce glass jar, and sent to the laboratory for asbestos analysis. Samples were analyzed by STAT Analytical in Chicago, Illinois.

A total of 90 test trenches were excavated at the site. Of those, 14 test trenches contained visible ACM and were not sampled. The remaining 76 test trenches were sampled and analyzed for asbestos. Analytical results showed that 33 of the 76 test trenches sampled contained greater than 1 percent asbestos. The results for the remaining 43 test trenches were non-detect for asbestos. Portions of grids containing either visible ACM or asbestos greater than 1 percent were excavated to 2 to 3 feet bgs. Figure 2 shows the test trench locations, which test trenches were determined to contain ACM, and which portions of the grids were excavated.

A total of 4 composite soil samples were collected from grids A6, B2, B11, and C8. The samples were analyzed for volatile organic compounds, semivolatile organic compounds, RCRA metals, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and pesticides. All analytical results were below remedial criteria

4.3 BACKFILL SAMPLING

Prior to the start of site restoration activities, START collected samples from the clay and sand sources to be used as backfill on the site. Clay and sand samples were analyzed for volatile organic compounds, semivolatile organic compounds, RCRA metals, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, and pesticides. All analytical results were below remedial criteria and indicated that the backfill could be used at the site.

The Johns Manville Site 2 is located on property owned by the City of Waukegan and Johns Manville Corporation and is currently under the management of IDNR. In 1959, as part of a shooting range for the Pan American Games, berms were constructed on the site to prevent bullets from traveling to neighboring properties. Materials used in the construction of the berms contained off-specification materials from the Johns Manville manufacturing facility located adjacent to the property. In the late 1960s, the berms were bulldozed to near grade. When its manufacturing activities ceased in 1998, ELM, a consultant to Johns Manville Corporation, conducted an assessment of Site 2. Sample analytical results indicated that 17 grids, each measuring approximately 100 by 100 feet, contained ACM at depths of up to 3 feet bgs. Samples were also collected and analyzed for lead because of the past shooting range activities, but no lead-bearing materials were identified.

On May 20, 2002, U.S. EPA, START, and ERRS mobilized to the site to began a removal action. Planned excavation activities were based on the ELM site characterization report. A total of 17 100-by-100-foot grids were to be excavated to depths of either 1, 2, or 3 feet bgs. For all grids not excavated below 2 feet bgs, START planned on collecting soil confirmation samples to ensure that contamination did not extend beyond the predetermined depth for each grid.

On May 21, 2002, ERRS began excavation activities. As excavation activities progressed, it became apparent that ACM was present both beyond the depths indicated in the ELM site characterization report as well as in neighboring grids marked as "clean" in the site characterization report. It was then decided by U.S. EPA, START, and ERRS that additional sampling would need to be conducted to accurately determine the extent of ACM at the site.

On June 27, 2002, ERRS began excavating test trenches in order to better define asbestos contamination at Site 2. A total of 90 test trenches were excavated on site. START inspected the test trenches for visible ACM. If visible ACM was present in the trench, the trench was not sampled and that portion of the grid was automatically marked for excavation. If no visible ACM was present, START collected a soil characterization sample and shipped it to the laboratory for asbestos analysis. All portions of grids with test trenches yielding samples with analytical results greater than 1 percent asbestos were marked for excavation. Of the 90 test trenches excavated, 14 contained visible ACM, 33 contained asbestos at

greater than 1 percent, and 43 were non-detect for asbestos. The remaining grids were excavated to 2 to 3 feet bgs.

During all site excavation activities, START collected daily perimeter and personnel air samples in order to monitor the transport of airborne asbestos off site and to monitor worker exposure. A minimum of four and a maximum of five perimeter air samples were collected depending on the location of site activities. A minimum of one and a maximum of three personnel air monitoring samples were collected depending on the number of site workers for the day. Analytical results were compared to the OSHA PEL of less than 0.1 asbestos fiber per cc. All analytical results were significantly below the PEL.

On August 29, 2002, excavation activities at Johns Manville Site 2 were completed. A total of 46,869.92 tons of ACM and soil was shipped off site to the Mallard Ridge landfill in Delevan, Wisconsin. Excavated grids were backfilled with approximately 2 feet of clay and an additional 1 foot of sand. After backfilling activities were completed, the site access road and parking lot were re-established and the site was hydro-seeded. On September 19, 2002, all removal activities at the site were completed.

APPENDIX

PHOTOGRAPHIC LOG

(21 Pages)

Photograph No.: 1
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Beginning of excavation at grid B5

Orientation: South
Date: May 21, 2002

Photograph No.: 2
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: North air monitoring station

Orientation: North
Date: May 22, 2002

Photograph No.: 3
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Lining of trucks

Orientation: Northeast
Date: May 28, 2002

Photograph No.: 4
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Watering soil during excavation

Orientation: South
Date: May 29, 2002

Photograph No.: 5
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Load-out of ACM-containing soil

Orientation: Northeast
Date: May 30, 2002

Photograph No.: 6
Orientation: East
TDD Number: S05-0203-007
Date: June 12, 2002
Location: Johns Manville Site 2
Subject: Power washing of truck tires before truck leaves

Photograph No.: 7
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: ACM in south wall of grid B7

Orientation: Southeast
Date: June 17, 2002

Photograph No.: 8
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: ACM from grid A15

Orientation: Northeast
Date: June 24, 2002

Photograph No.: 9
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: ACM in north wall of grid C13

Orientation: Northeast
Date: July 1, 2002

Photograph No.: 10
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: ACM in west wall of grid B13

Orientation: West
Date: July 2, 2002

Photograph No.: 11
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Test trench C10-northwest

Orientation: West
Date: July 3, 2002

Photograph No.: 12
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Test trench B2-southeast

Orientation: North
Date: July 10, 2002

Photograph No.: 13
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Test trench A8-southwest

Orientation: North
Date: July 15, 2002

Photograph No.: 14
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Scraping surface of grids

Orientation: Southeast
Date: July 17, 2002

Photograph No.: 15
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Excavation of grids C2 and C3

Orientation: East
Date: August 6, 2002

Photograph No.: 16
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Asbestos pipe in grid B2

Orientation: Northeast
Date: August 19, 2002

Photograph No.: 17
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Load-out of remaining soil

Orientation: Northeast
Date: August 27, 2002

Photograph No.: 18
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Backfilling of grids B2 and B3 with clay

Orientation: Northeast
Date: August 30, 2002

Photograph No.: 19
Orientation: West
TDD Number: S05-0203-007
Date: August 30, 2002
Location: Johns Manville Site 2
Subject: Grids after backfilling with 2 feet of clay and additional 1 foot of sand

Photograph No.: 20
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Access road and parking lot re-establishment

Orientation: Southeast
Date: September 6, 2002

Photograph No.: 21
TDD Number: S05-0203-007
Location: Johns Manville Site 2
Subject: Central portion of site completely backfilled with clay
Orientation: Southeast
Date: September 6, 2002